

ABSTRACT

This invention provides a soft-reference four conductor magnetic memory storage device. In a particular embodiment, there are a plurality of parallel electrically conductive first sense conductors and a plurality of parallel electrically conductive second sense conductors. The first and second sense conductors may provide a cross point array or a series connected array. Soft-reference magnetic memory cells are provided in electrical contact with and located at each intersection. In addition there are a plurality of parallel electrically conductive write rows substantially proximate to and electrically isolated from the first sense conductors. A plurality of parallel electrically conductive write columns transverse to the write rows, substantially proximate to and electrically isolated from the second sense conductors, forming a write cross point array with a plurality of intersections, is also provided. Sense magnetic fields generated by at least one conductor orient the soft-reference layer but do not alter the data stored within the cell. An associated method of use is also provided.